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REPORTS OF MEETINGS

Environmental Management of Enclosed Coastal Seas. EMECS '90

Clearly the environmental problems facing the enclosed coastal seas are a challenge facing many parts of the world. Accordingly, major aims of EMECS '90 were expressed as: "to explore principles and measures for comprehensive environmental management," and "to promote international exchange of views on wide aspects of environmental management and appropriate use of enclosed coastal seas, thereby contributing to the 21st Century."

The conference was expertly planned, organized and sponsored by the Japanese hosts, who included:

—The Governors and Mayor's Conference on the Environmental protection of the Seto Inland Sea
—Environment Agency of Japan
—Hyogo Prefectural Government
—Kobe City Government
—National Institute for Research Advancement
—Seto Inland Sea Environmental Conservation Association.

UNEP (United Nations Environment Programme) was a co-sponsor, and there were numerous other supporters.

As a mark of the high profile accorded this conference, it got rousing TV and news media coverage, was officially opened by his Imperial Highness, Prince Takamado, and was attended by Ishimatsu Kitigawa (Minister of State and Director General of the Environment Agency of Japan), Toshitami Kaihara (Chairman of the Governors and Mayor's Conference on the Environmental Protection of the Seto Inland Sea, Chairman of the Seto Inland Sea Environmental Conservation Association, and Governor of Hyago Prefecture), and M. K. Tolba (Executive Director, UNEP).

Prince Takamodo in his welcoming address noted "International cooperation is necessary to solve such problems for humankind, and it is significant that forty international countries are represented at this conference."

The keynote address was given by Dr. Bill Long (Environment Director, O.E.C.D.), and entitled "Economic Growth and Environmental Management—Putting our Home in Order" and a very excellent and thought provoking effort it was. Of note from his speech was the quotation from Vice President Hubert Humphrey in 1969:

> "In the absence of planning, coastal resources tend to become pre-empted on a 'first come, first served' basis that spawns a bruising anarchy.... Solutions are hampered because the coastal margins are a thicket of vested interests....

Sadly his observation can be applied even two decades later. As Long noted: "Success stories in confronting coastal zone management problems are difficult to find on a worldwide basis"

The major message in Bill Long's keynote address was the focus on the fashionable buzzwords of "sustainable development" which have been embraced by a groundswell of international interest. What does it mean for coastal zone management? Applicable to the enclosed coastal seas are the aims of:

—controlling population growth
—accelerating economic development in Third World countries

—promoting technological change toward "clean green" growth
—pricing resources to reflect relative scarcities
—placing unique and vulnerable ecosystems under sound management
—safeguarding and transmitting to future generations a quality of natural resources that will provide a continuing flow of economic and environmental resources, including amenities

The O.E.C.D. believes that Sustainable Development must be grounded on a series of widely acceptable economic principles. Fundamentally that is sound resource management which requires, *inter alia*, (1) that the polluter pays for pollution control; (2) that the user pays for resource use; (3) that government failures in resource management and environmental policy making are identified and corrected; (4) that environmental and economic policies are developed and applied in a fully integrated manner.

> "Possibly the most important factor in the pursuit of Sustainable Development is 'getting the price right'. Unless prices for raw materials and products properly reflect the social costs, and unless prices can be assigned to air, water, and land resources that presently serve as cost free receptacles for the waste products of society, resources will be used inefficiently and environmental pollution will likely increase."

Long concluded:

> "Thus the future priorities for protecting and maintaining inland sea ecosystems must, in my view, include: applying full-cost pricing to heretofore undervalued or uncosted resources, such as wetlands and wildlife habitat, as well as clean air and water... developing and introducing new technologies to minimize the generation of wastes and the emission of pollutants... promoting the integration of economic and environmental policies through changes in institutional arrangements and by incorporating environmental values systematically into economic sector planning... identifying and addressing conflicting policies that that impact negatively on coastal management objectives... and establishing firm, long term goals and targets for achieving pollution control objectives."

The conference itself comprised of 5 Sessions, namely:

(1) Present state of environmental pollution of enclosed coastal seas, and measures for environmental protection.

(2) Ecological system and fishery resources in enclosed coastal seas.

(3) The appropriate use of enclosed coastal seas.

(4) Management and administration of enclosed coastal seas.

(5) Enclosed coastal seas and human activities.

Some 156 papers were listed in the 5 sessions, of which 44 were poster papers, which were presented over two days. Both Japanese and English languages were used, with a full interpreter service. Most papers are to be published in the proceedings, which will appear as an issue of the the *Marine Pollution Bulletin*.

Apart from the extraordinary and excellent organization of the Japanese hosts, the conference was notable for its pronouncements on the need for interdisciplinary approaches to the problem-solving of enclosed inland seas, and its adoption of the *Seto Inland Sea Declaration* at the Plenary session. This declaration (slightly edited) appears below:

The Seto Inland Sea Declaration (Translation from Japanese)

Meeting in Kobe City, Hyogo Prefecture, on the eastern coast of the Seto Inland Sea, we, the participants of the International Conference on the Environmental Management of Enclosed Coastal Seas '90 (EMECs '90), discussed the urgent need for environmental protection and appropriate use of enclosed coastal seas in the world.

Enclosed coastal seas, which are mostly surrounded by land and are endowed with blessed natural environments, have long been used for fisheries and other human activities such as waterborne traffic and as recreation. Thus they have supported flourishing settlements along their coasts as well as fostering a wide variety of cultures.

However, when people become overconfident of the blessings of the seas in pursuing their

activities, detrimental changes in the environment may deprive people of the benefits they now enjoy.

Recognizing that environmental protection and appropriate use of enclosed coastal seas are matters of urgent and global concern, and given that the rich environments of enclosed coastal seas are in serious jeopardy in many parts of the world, we wish to emphasize that the following points:

The rich environments and great benefits of enclosed coastal seas must be preserved to pass on to future generations. To this end, all those concerned should seek to advance the use of these seas in a sustainable manner, while conserving their environments.

International and regional cooperation in the coastal zone, including technology transfer and information exchange, should be further enhanced.

As these seas have already been closely related to human life, the active participation of the public in order to achieve appropriate environmental conservation and protection should be strongly encouraged through the extensive development of environmental education and the further enhancement of public awareness.

Due to the poor exchange of water, tremendous efforts are required in order to restore the environmental quality of enclosed coastal seas once they become polluted.

Furthermore, algal blooms, hypoxie and anoxia have had adverse effects on fisheries and recreation in many enclosed coastal seas.

In order to effectively prevent the pollution of the water and sea floor, research, monitoring and exchange of information on: the properties of the environments of enclosed coastal seas, the effects of contamination on ecosystems, the mechanisms of the outbreaks of algal blooms and the causes of hypoxia as well as methods

Figure 1. Members of the S.C.O.R. Working Group 89: Sea Level and Erosion of the World's Coastlines. From left to right: J. Terwindt (Netherlands), M. Baba (India), T. Healy (New Zealand), K. Dyer (United Kingdom), A. Ibe (Nigeria), R. Dean (U.S.A.), P. Komar (U.S.A., chairman), N. Lanfredi (Argentina, Co-Chairman).

and techniques for their prevention should be additionally promoted. Further studies should be conducted on the protection of habitat and marine resources as well as the potential effect of global warming on the physical and biological ecosystems.

Land and sea resources and the environment are closely interrelated and land use, industrial activities, coastal reclamation and other activities, affect the quality and availability of coastal land, coastal waters, the ecosystems, the natural landscape and the marine environment.

Thus a comprehensive, integrated approach to coastal zone management is needed to ensure economic development as well as environmental protection of these areas. This can be achieved only through close co-operation between national, regional and local government. Such co-operation requires strong political commitment and consensus at all levels.

A comprehensive approach would involve planning at regional and local levels, preventive policies and appropriate control of the inflow of heavy metals, hazardous chemicals, organic and other pollutants from catchment basin and other areas.

In addition, conservation and preservation measures are needed to maintain the natural character of coastal areas.

In implementing policies effectively, appropriate combinations of regulatory measures and economic instrument would be needed.

The implementation and performance of policies should be constantly reviewed.

As can be seen from the above, a comprehensive contribution from all fields of researches, including ecological, social, economic and cultural sciences are needed. In order to advance the use of enclosed coastal seas in a sustainable manner while conserving their environments.

Accordingly, we eagerly hope for continued opportunities to promote interdisciplinary comprehensive research and the international exchange of views and information.

We note with satisfaction that a body of researchers on the Sato Inland Sea is being organized for the furtherance of studies on its environmental conservation and appropriate use.

The utilization of enclosed coastal seas in a sustainable manner in Industrialized and developing countries is a particularly important task for the entire word. To avoid the recurrence of environmental pollution and deterioration experienced by industrialized countries, the transfer of appropriate knowledge and experience from developed countries to developing countries should be further promoted.

We welcome the initiative of the Japanese government to implement a training program beginning in 1990, in order to transfer technology for environmental management of enclosed coastal seas to developing countries.

We highly appreciate the fact that those experts from various nations and regions, concerned with the problems of enclosed coastal seas, have met at EMECS '90 and, through the exchange of information and experience on respective seas, have explored ways and means of using these seas in a sustainable manner, while conserving their environments, and based on the recognition that the sea, which links all nations, is the origin of life. In full confidence that EMECS '90 has contributed greatly to the solution of problems concerning enclosed coastal seas, which are matters of the global concern, we earnestly hope that another such gathering will take place in near future, in the light of the extent and importance of the problems.

Kobe, August 6, 1990
International Conference on the
Environmental Management of
Enclosed Coastal Seas 1990

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53rd Meeting of the U.S. Army Corps of Engineers Coastal Engineering Research Board (Fort Lauderdale/Dania, Florida, 5–7 June 1990)

The U.S. Army Corps of Engineers Coastal Engineering Research Board held its 53rd meeting on June 5–7, 1990, in Fort Lauderdale/Dania, Florida. The theme of the meeting was coastal inlets. The meeting included three panels, the first of which was on determining benefits for coastal projects. Mr. David Schmidt of the Corps' Jacksonville District made a presentation on an empirical computer model to simulate damages for existing conditions in future years, thereby establishing benefits from construction of coastal projects. Dr. Robert C. Dean of the University of Florida recommended modifying the present benefit/cost analysis to include benefits to areas adjacent to projects. He noted that when sand spreads from the project to adjacent areas, the gain in benefits in the project-adjacent areas is greater than the loss of benefits in the project areas. He also discussed the consequences of failing to bypass sediment at inlets constructed or modified for navigational purposes. Mr. William T. Hunt of the Directorate of Civil Works, Headquarters, US Army Corps of Engineers, gave a status

Figure 1. U.S. Army Coastal Engineering Research Board. Members present: (from left to right): Professor Robert A. Dalrymple, Professor Fredric Raichlen, Major General Patrick J. Kelly (President). Professor Robert O. Reid, and Colonel Daniel M. Wilson.

report on the economic evaluation of Corps of Engineers shore protection projects. An initial draft of the National Economic Development Procedures Manual for Coastal Storm Damage and Erosion was completed in August 1989. The document gives a general overview of important principles of economic analysis and planning for Federal projects. He noted that continued interdisciplinary communication between coastal engineers and economists is a precondition for development of practical working guidance for evaluating Federal shore protection projects.

The second panel was on the effects of tidal inlets on shorelines. Dr. Dean discussed the impact of inlets on coastal erosion. He noted that there are several causes of erosion due to navigational entrances. These are offshore disposal of dredged material, interruption on the longshore sediment transport, and modification of ebb and flood tidal shoals. He stated that the alternative at a navigational entrance is to reinstate the natural process through the net longshore sediment transport around the entrances to an appropriate location on the downdrift beach. He noted that proper sand management is more than a technical problem, and shorefront property owners participate in a "tug-of-war" over limited sand resources. Ms. Joan Pope of the Coastal Engineering Research center (CERC) discussed the Kings Bay monitoring study as a case study on the impacts of inlet stabilization, and similar monitoring studies at other inlets. She noted that these studies may illustrate a fairly rapid collapse of the natural ebb-delta lobe, and eventual loss of the affiliated ebb-delta platform. It is the loss of this ebb-delta platform which can influence the sediment budget and wave conditions over broad sections of coast. Chains of events can take decades and centuries to fully evolve. Mr. T. Neil McLellan of CERC discussed the placement of dgedged material from inlet navigation channels to form nearshore berms. This type of placement can be used to retain the material in the littoral system, providing a still to reduce the movement of material offshore, a source of sand for downdrift areas, and a sand source for the beach profile.

The third panel was on sand bypass systems for inlets. Mr. Kirby G. Green, III, Director of Beaches and Shores, Florida Department of Natural Resources, presented the State of Florida's position on sand bypass systems. Mr. Robnert W. Clinger of Palm Beach County discussed the political and institutional impacts of sand bypass systems. There was discussion of three sand bypass systems using jet pumps. Mr. David R. Patterson of the Corps' Los Angeles District discussed the sand bypass system in Oceanside, California; Mr. Augustus T. Rambo of the Corps' Philadelphia District, the sand bypass system at Indian River Inlet, Delaware; and Mr. James E. Clausner of CERC, the automated bypass system at the Nerang River Entrance, Australia. Information was provided on the characteristics and performance of the three systems.

In addition to the three panels, Mr. Charles F. Stevens of the Corps' Jacksonville District made presentations on the changing role of inlets in coastal management, and on the Coast of Florida study. Dr. Donald K. Stauble of CERC presented information on the Geotechnical Data Base. Ms. Julie D. Rosati gave a report on the Engineer Manual, "Coastal Inlet Hydraulics and Sedimentation," which is in preparation at CERC, and Dr. C. Linwood Vincent, the Coastal R&D Program Manager, presented an overview of the next phase of CERC's tidal inlet research. Mr. E. Clark McNair, Jr., of CERC gave an update on the Dredging Research Program and the Oil Spill Initiative. Mr. Gary L. Howell presented information on CERC's new nearshore directional wave gage, and Mr. Jeff Lillycrop presented information on the Scanning Hydrographic Operational Airborne Laser Survey (SHOALS) System.

A summary proceedings of the meeting will be available at a later date. The Coastal Engineering Research Board meets twice annually, and meetings are open to the public. Point of contact for information on the meetings is Ms. Sharon Hanks of CERC, administrative assistant to the Board, at (601) 634-2004, FAX (601) 634-2055. Copies of proceedings are available from the Coastal Engineering Research Center.

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Committee Reports from the Skagen Symposium Skagen, Denmark, 2–5 September 1990

REPORT FROM COMMITTEE NUMBER 1, SESSION A: CLIMATE DEVELOPMENT— SEA LEVEL CHANGES

Sea level has increased on the order of 120 m since the last glaciation. For the last century the trend in relative level appears to be 1–2 mm per year rise, as a global average. While there is no general evidence for recently accelerating trends, individual records may show variability in trends due to local forcings.

Predictions of sea level rise due to increased greenhouse effects have become less dramatic over the years. The new report from the Intergovernmental Panel on Climate Change (IPCC) suggests a 66 cm rise over present levels by year 2100 for a "Business as Usual" scenario. For a scenario with an accelerated abatement strategy, the rise may be as low as 35 cm. The uncertainty is of the order of a factor of two. Nevertheless, even these more cautious predictions correspond to annual rises of 3-6 mm year and are thus about three times higher than recent trends. However, the values are only global averages and local land uplift or subsidence should be taken into account to evaluate the total effect. For example, in the northern part of the Baltic Sea, the current uplift after the last ice age may still dominate over a Greenhouse-induced rise. Conversely, some areas such as large river deltas are already undergoing higher than average rates of apparent sea level rise due to subsidence which will be amplified.

Also, other factors besides sea level rise can influence shoreline evolution—especially the available sediment supply. Even in areas where there is good evidence of sea level rise during the last 200 years, *e.g.* in Brittany, a retreat of shorelines composed of loose sediments (*e.g.* pebble spits) may be rare or absent. Therefore generalizations are dangerous!

The importance of both local and global monitoring is stressed. One example is the Global Sea Level Observing System (GLOSS), which has as one of its main objectives the improvement in quality and quantity of long term sea level data. The separation of vertical land movements from real sea level changes in tide gauge records by advanced geodetic techniques is in high priority.

Parallel to monitoring of sea level, the development of climate should be followed—especially with respect to wind variability ("storminess") which may determine extremes of sea level variation.

Although the sea level rise appears to be lower than previously anticipated, it will may have a series of unwanted effects. Direct flooding is possible in low lying areas, but even then this is improbable an increase in coast erosion may result. Further, intrusion of saltwater, which threatens the fresh water supply is possible. Much more work remains to be done on the consequences of sea level change.

Concerning coastal protection measures, a series of aspects should be taken into account: technical feasibility, economic justification, social factors, environmental factors, geological/geographical factors and legal permissibility. No universal strategy can be recommended. In some cases, fortification of present dikes or construction of new ones may be necessary. In other cases it may be better to leave nature to establish new coastlines.

Finally it should be pointed out, that in none of the presented contributions was the credibility of the current ideas of sea level change calculations discussed (*i.e.* those of the IPCC). The results were accepted at face value.

Should sea-level rise be prevented, then a change in global energy policy is called for as, for example, put forward in the "Brundtland Report."

Chairman: J. Fenger, Denmark
Co-Chairman: P. L. Woodworth, UK
Members: Dunn Christensen (Denmark), M. A. Gonzales, (Argentina), Lorance Lisle, (USA), Andrea Töppe, (FRG), and Yuri Dolotov, (USSR)

REPORT FROM COMMITTEE NUMBER 2, SESSION B: COASTAL GEOMORPHOLOGY AND COASTAL SEDIMENT TRANSPORT

The 1990s promise to be an exciting time for coastal research because it is the International Decade for National Hazard Reduction, and there is an increasing awareness of environmental problems world-wide. Beaches are the worlds No. 1 recreational area and beach erosion is a worldwide problem.

The areas where research needs to be directed are relationships between sea-level rise and coastal response, the effectiveness of beach nourishment in combating coastal erosion, the storage role that tidal inlets play in regulating coastal sand and beach erosion, improving our modelling capability, obtaining better field data to validate numerical models, and coastal hazard mitigation.

It is important to study the response of a variety of coastal systems to rising sea level over a period of decades. This can be achieved in areas adjacent to ice sheets where the land is sinking relative to the sea.

Beach nourishment is becoming a primary means of stabilising beaches. However there has been very little attention paid to monitoring beach nourishment schemes. There is a need to monitor existing schemes, and to better understand coastal processes to help assess the viability of the schemes and sources of sand.

Conceptual and empirical modeling of tidal inlet systems has proceeded to a stage where they provide useful tools for understanding tidal inlet processes in a qualitative/semiquantitative way. There is a concurrent move by researches in Europe, U.S.A., New Zealand, and Australia toward developing numerical models of these systems. Because of the complexity of inlets, individual components are being modeled in the first instance. It will be some years before comprehensive numerical models treat tidal inlets as a complete systems.

Numerical simulation models of beaches have reached a stage where we can use them not only to reproduce historical events, but also to make tentative predictions into the future. As far as nearshore morphodynamics is concerned, the one-line models will be the only models available for prototype applications in the near future.

One of the major problems of forecasting into the future is the problem of determining future wave/sea level conditions.

There is a real need for good quality field data to calibrate numerical models. We should be careful that model development does not outstrip our ability to understand and incorporate important physical processes. For instance, we are only just beginning to realize the significance of infragravity waves in beach processes.

The 1990s will provide an opportunity for researchers to apply new tools to old problems. Sophisticated instrumentations such as GIS Systems and acoustic doppler current profilers, the capability of remote sensing and better numerical models will improve our quantitative understanding and predictive capability of coastal processes. Progress will be enhanced through scientists and engineers cooperating on projects.

Chairman: Terry Hume (NZ)
Co-Chairman: Troels Aagaard (Dk)
Members: Hans Hanson (Sweden), Steven Leathermann (USA), William Hunter (USA), K. Strand Petersen (Denmark), John Shaw (Canada), Gary Zarillo (USA), Jean Claude/Bodere (France)

REPORT FROM COMMITTEE NUMBER 3, SESSION C: COASTAL EROSION AND PROTECTION

Introduction

The coast is a dynamic system forming the transition from land to sea. This system responds to forces of different time scales, producing both long term and short term changes in the position of the shoreline. Erosion occurs when the shoreline retreats at a given location, considered over a substantial length of time. Development of coastal erosion can be by natural forces or by man-made interference. Natural causes include among others the effect of sea level rise, the effect of global climate change and the existence of natural littoral barriers. Some of the major causes of man-made coastal erosion are navigation channels, ports, urban development of the coastal zone and coastal structures.

Evaluation of Coastal Erosion

A distinction must be made between storm-induced erosion and long term erosion. The former is very spectacular but on a long term basis it presents no problems. It is the long term erosion that needs particular attention.

To evaluate whether coastal erosion exists, the long term trend in the position of the coastline needs to be established. The best way to do this is by measurements of different kinds and by historic analysis of specific situation. Knowledge of coastal processes and of methods to define those processes has greatly increased over the last decade, but there is still a need for further improvement, particularly regarding sediment transport phenomena and related beach and profile changes.

Coastal Protection

Once coastal erosion has been detected and evaluated, action for coastal protection can be undertaken. Where possible, solutions which support the natural processes should be considered first, such as artificial nourishment and sand by-passing across littoral barriers. Hard solutions such as the construction of groins and offshore breakwaters or other structures should be considered only under very special circumstances.

In the design of large-scale projects, the effect of technical measures should be modeled, either by means of physical models or by numerical models. Such analysis may reveal unexpected effects and may assist in optimizing the construction.

Management of the Coast

We recognize that the coast, a part of the human environment, must be properly managed. This includes adequate management programs and systematic monitoring. The establishment of set-back lines, determined by technical, scientific and administrative procedures, which includes an optimum for the present and the future, is highly recommended. Coastal management must include dune, beach and offshore profile maintenance.

Chairman: F. Gerritsen (USA)
Co-Chairman: M. Losada (Spain)
Members: J. Brezina (Venezuela), P. Bruun (USA), A. Günbak (Turkey), Ann Skov (Denmark), G. M. Idorn (Denmark), P. Roed Jacobsen (Denmark), M. Larson (Sweden), E. Mansard (Canada), Ray McAllister (USA), and H. J. Verhagen (The Netherlands)

SKAGEN SYMPOSIUM (SKAGEN, DENMARK), 2–5 SEPTEMBER 1990

STATEMENT BY: WORLD METEOROLOGICAL ORGANIZATION

On behalf of the secretary general Professor Obasi from the World Metereological Organization and on behalf of the Danish permanent representative of WMO director Lars Prahm, from the Danish Meteorological Institute, I have the pleasure of conveying to you compliments from the World Meteorological Organization.

The Greenhouse Effect and its feared consequences have received increasing attention from scientists, authorities and the public all over the world.

Natural disasters might affect many densely populated territories especially many coastal areas. Thus, climate change, coastal protection and research subjects to be treated at this sympsoium as become a central issue in the public debate worldwide.

(1) The World Meterological Organization and its 165-member countries is organizing global climate monitoring through the World Weather Watch, measuring and communicating information on weather and climate all over the world day and night.

Together with other international organizations, WMO is running the world climate programme and last year WMO initiated, together with the United Nations Environmental Programme (UNEP), the "Inter-Governmental Panel on Climate Change" (IPCC).

The IPCC has been accepted by governments in most countries as a central organization to coordinate the global efforts for the study of climate change including:

(a) the scientific aspects
(b) the efforts
(c) the policy aspects

Chairmen for working groups dealing with these subjects were the director general from

the meteorological services in the United Kingdom and the USSR, respectively, and a vice foreign minister from the USA.

The IPCC held its fourth plenary meeting last week and the first IPCC report has now been released. This is probably the most comprehensive report on climate change ever written with contributions from about 300 experts and many other leading scientists from all over the world.

The following contribution given by Dr. Jes Fenger will highlight some main results from this IPCC study. [Editorial Note: Presented at the Skagen meeting and available in the Proceedings].

Here, I would just mention that the most important tools for climate "forecasting" are global climate models, *i.e.* in principle global weather forecast models computing the weather not only for a single week but for up to 100 years.

The reliability of forecasts for future climate and sea level is thus highly dependent on the accuracy of our weather and climate forecast models.

The most important uncertainties in thee models are:

(a) the role of the oceans

(b) the role of clouds

Though the IPCC report represents a most reliable estimate of the future climate change, the uncertainties are still serious. This is clearly illustrated by the very recent results from a coupled atmosphere-ocean climate model at the Max Planck Institute in Hamburg which shows new forecasts of climate development with an increasing temperature at only 0.1°C per decade and only a minor sea level change for the next 30 years.

This is mentioned to emphasize that we still do not have the final truth about human induced Greenhouse Effects and its contribution to climate change—we still face large uncertainties.

However, the possible dramatic consequences of human-induced climate change are cause to start preparations for the negotiation of a global climate convention this month on invitation by WMO and UNEP in Geneva. Simultaneous with these negotiations, further monitoring and research on climate change is needed on a national and international basis.

The World Meterological Organization and the Danish Meterological Institute appreciate your effort in the field of coastal affairs and wish you a successful symposium here in Skagen in the coming days.

J. T. Dunn-Christensen
Danish Metereological Institute

[Proceedings of the Skagen Symposium are available as a two-volume set (approximately 950 pages) for $120 postpaid. Copies may be obtained from: Journal of Coastal Research, P.O. Box 1897, Lawrence, KS 66044, USA. (Editorial Note: The proceedings volumes are comprised by papers that are facsimile reproductions of manuscript typescript).]